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TITLE: Multimodal Retrospective and Prospective Unit-Level Analysis of Military Workplace Violence

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13. SUPPLEMENTARY NOTES

14. ABSTRACT
Work focused on acquiring, processing, and analyzing multiple data sets for the retrospective study that will test hypotheses generated from the socio-ecological framework of the factors correlated with violence perpetration by active duty soldiers and marines. Multiple data sets including information on approximately 1.9 million soldiers and marines who were on active duty between 2000 and 2012 were acquired and processed; the data acquisition for the retrospective study is complete except for one dataset from the Army containing crime information for which we continue to submit requests. For the prospective study, two instruments (one for enlisted personnel, the other for leadership) were developed and tested in house; a protocol for pilot testing the instrument with veterans is being negotiated with RTI's IRB. IRB approval from RTI's IRB for fielding the prospective study (two waves of data collection at six military installations) is pending a small revision; once approval is received materials will be submitted to the NHRC IRB and HARPO. In addition, Health Risk Behavior survey data were obtained and analyzed to test hypotheses about risk and protective factors and criminal and risk taking behavior; a manuscript was drafted and will be submitted to a peer-reviewed journal early next year. A poster providing information on the study was presented at the 2014 Military Health Services Research Symposium.

15. SUBJECT TERMS
Military workplace violence

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1. INTRODUCTION

More than a decade of war characterized by multiple deployments and intense combat exposure has increased concerns about US service members' behavioral health, risk-taking behaviors, disciplinary and criminal actions, and targeted acts of violence including homicide. The Multimodal Retrospective and Prospective Study of Military Workplace Violence (MWV) is using complementary retrospective and prospective studies to identify static and dynamic predictors of targeted violence in the US military workplace. The research will identify factors that increase and mitigate risk of military workplace violence (MWV) at individual, unit and installation levels to inform prevention and interventions and will offer concrete recommendations to reduce risk and increase protective factors. The research, being conducted by RTI International in cooperation with the Naval Health Research Center (NHRC), is addressing the following research hypotheses:

1. Deployment characteristics, including number of deployments and combat intensity, will increase MWV;
2. Disciplinary infractions, minor crimes, PTSD and other mental problems, and substance abuse will increase MWV;
3. Treatment and social support will mediate the relationships among deployment characteristics, intervening outcomes, and MWV; and
4. Individual and family/peer risk and protective factors and training will moderate the relationships between deployment, intervening outcomes, and MWV.

The retrospective study entails the acquisition and analysis of administrative data for soldiers and marines who were on active-duty between 2001 and 2012 from multiple sources that will be combined and analyzed to test the research hypotheses. The prospective study will entail two rounds of anonymous surveys with members of randomly selected companies at four United States Army Bases (Fort Bragg, Fort Carson, Fort Hood, and Joint Base Lewis McCord) and two United States Marine Corps installations (Camp Lejeune and Camp Pendleton).

2. KEYWORDS

Military
Workplace Violence
Combat
Deployment
Traumatic Brain Injury
Post-Traumatic Stress Disorder
Risk Taking Behaviors
Risk Factors
Protective Factors
Social Support
Mental Health
Substance Abuse

3. OVERALL PROJECT SUMMARY

The Multimodal Retrospective and Prospective Study of Military Workplace Violence (MWV) is using complementary retrospective and prospective studies to identify static and dynamic predictors of targeted violence in the US military workplace. The conceptual model shows a framework within which ***risk and protective factors*** lead to targeted ***MWV*** directly and indirectly through ***intervening outcomes*** that in turn also may lead to and, thus, serve as potential predictors of MWV. These intervening outcomes include PTSD and other mental health issues, substance abuse, disciplinary infractions, and criminal acts. These linkages may be ***mediated*** by preventive efforts (e.g., predeployment stress inoculation training for primary prevention of combat-related stress disorders) and by timely and appropriate intervention including substance abuse and mental health treatment, as well as support in theater and upon reentry. The effects of deployment may be ***moderated*** by individual characteristics, as well as by military training and support. The overall study design is shown in Figure 2.

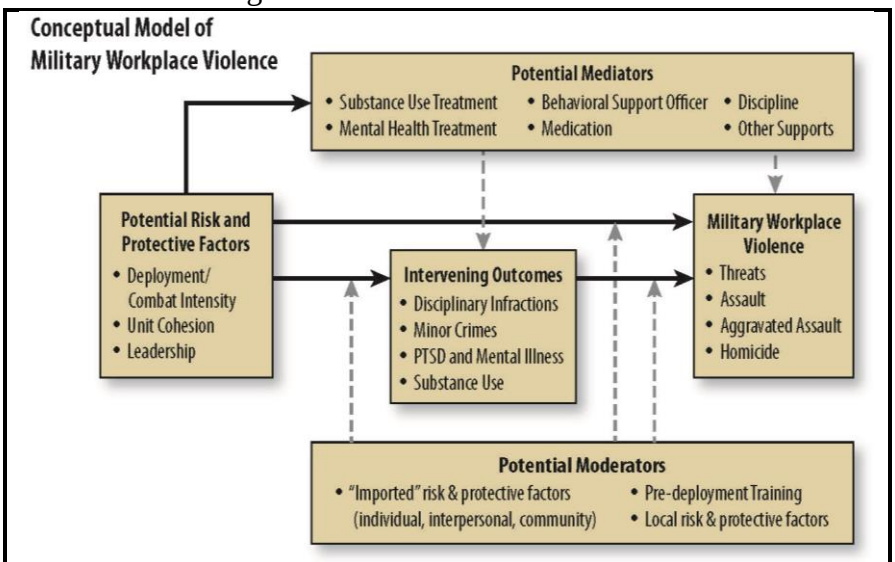

Figure 1. Conceptual model of Military Workplace Violence.

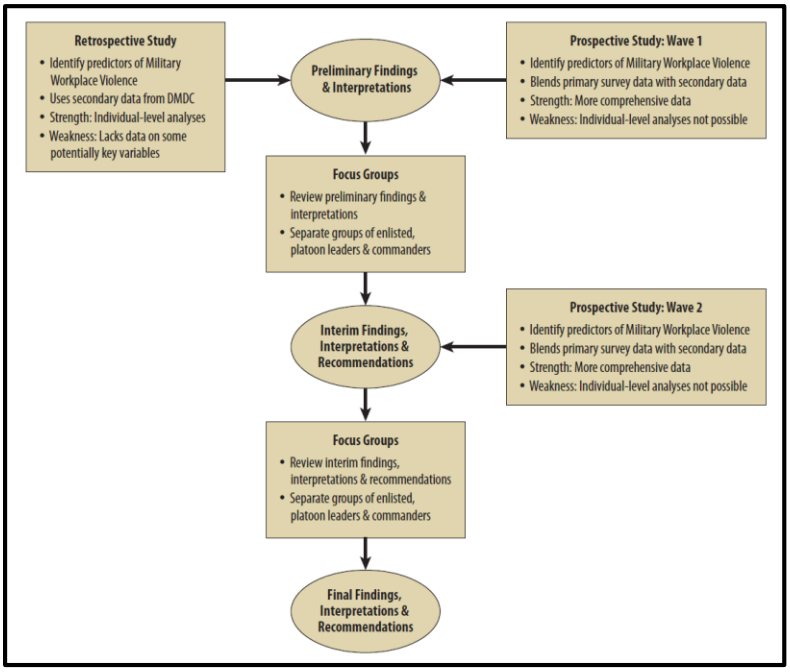

Figure 2. Study Design

3.1 Retrospective Unit-Level Analysis of Military Workplace Violence

The goal of the Retrospective Study is to develop and analyze unit-level measures to test the overarching research hypotheses identified above. Specifically, the goal is to establish a unit of observation equal to a UIC-quarter. The UIC quarter measures will summarize or reflect the occurrence of the event or incident of interest within the UIC during a specified quarter. For example, a variable will be created that summarizes the total number of days individuals assigned to each UIC were deployed during each quarter in our study period (2001-2012).

During Year 2 of the research, considerable progress was made on the assembly and processing of multiple administrative datasets for all individuals on active duty in the US Army or US Marine Corps between January 2001 and December 2012 (1,936,524 individuals). These data were obtained by Dr. Valerie Stander of the Naval Health Research Center, deidentified, encrypted, labeled with study identifiers, and securely transmitted to RTI for processing. The following data were obtained:

- CHAMPS inpatient and outpatient diagnosis and treatment data
- Accession and discharge data
- UIC assignment data
- PDHA and PDHRA data
- DIBRS data
- Drug testing, screening, and treatment data
- COPS data for the USMC (still working to obtain US Army COPS data)

A coding schema developed for the ICD-9 CHAMPS data was successfully applied to both the inpatient and outpatient data. The distribution of mental health, substance, and injury diagnoses within the coded data are shown in Table 1.

Table 1. Mental Health, Substance Use, and Injury Diagnoses for All Soldiers and Marines on Active Duty 2001—2012

Variable	Label	N	Mean	Std Dev
adjust_ever	5.1 Adjustment Disorder	1936524	0.1561	0.3629
schizoPsych_ever	5.10. Schizophrenia and other psychotic disorders	1936524	0.0056	0.0747
alcohol_ever	5.11. Alcohol-related disorders	1936524	0.0848	0.2785
subdis_ever	5.12. Substance-related disorders	1936524	0.0940	0.2918
selfinjury_ever	5.13. Suicide and intentional self-inflicted injury	1936524	0.0167	0.1280
mhdisorder_ever	5.14.1 Codes related to mental health disorders	1936524	0.2481	0.4319
sadisorder_ever	5.14.2 Codes related to substance-related disorders	1936524	0.1869	0.3898
dissdisorder_ever	5.15.1 Dissociative disorders	1936524	0.0006	0.0251
eating_ever	5.15.2 Eating disorders	1936524	0.0019	0.0437
fact_ever	5.15.3 Factitious disorders	1936524	0.0002	0.0144
psychdis_ever	5.15.4 Psychogenic disorders	1936524	0.0016	0.0400
sexid_ever	5.15.5 Sexual and gender identity disorders	1936524	0.0159	0.1253
sleep_ever	5.15.6 Sleep disorders	1936524	0.0396	0.1951
somatoform_ever	5.15.7 Somatoform disorders	1936524	0.0191	0.1369
othermh_ever	5.15.8 Mental disorders due to general medical conditions not elsewhere classified	1936524	0.0008	0.0282
othermiscmh_ever	5.15.9 Other miscellaneous mental conditions	1936524	0.0100	0.0994

anxiety_ever	5.2. Anxiety disorders	1936524	0.1152	0.3192
conduct_ever	5.3.1 Conduct disorder	1936524	0.0018	0.0422
defiant_ever	5.3.2 Oppositional defiant disorder	1936524	0.0003	0.0159
add_ever	5.3.3 Attention deficit disorder and Attention deficit hyperactivity disorder	1936524	0.0160	0.1255
delirium_ever	5.4. Delirium, dementia, and amnestic and other cognitive disorders	1936524	0.0171	0.1296
comm_ever	5.5.1 Communication disorders	1936524	0.0000	0.0000
developdis_ever	5.5.2 Developmental disabilities	1936524	0.0002	0.0130
intellect_ever	5.5.3 Intellectual disabilities	1936524	0.0001	0.0107
learning_ever	5.5.4 Learning disorders	1936524	0.0011	0.0332
motorskill_ever	5.5.5 Motor skill disorders	1936524	0.0000	0.0029
elimination_ever	5.6.1 Elimination disorders	1936524	0.0007	0.0271
otherchildhood_ever	5.6.2 Other disorders of infancy childhood or adolescence	1936524	0.0005	0.0219
pervasive_ever	5.6.3 Pervasive developmental disorders	1936524	0.0003	0.0173
tic_ever	5.6.4 Tic disorders	1936524	0.0007	0.0272
impulse_ever	5.7. Impulse control disorders, not elsewhere classified	1936524	0.0035	0.0589
bipolar_ever	5.8.1 Bipolar disorders	1936524	0.0157	0.1242
depressive_ever	5.8.2 Depressive disorders	1936524	0.1087	0.3113
personality_ever	5.9. Personality disorders	1936524	0.0258	0.1587
joint_ever	16.1. Joint disorders and dislocations; trauma-related	1936524	0.1212	0.3264
complicationdevice_ever	16.10.1 Complication of device; implant or graft	1936524	0.0081	0.0899
complicationsurgical_ever	16.10.2 Complications of surgical procedures or medical care	1936524	0.0276	0.1637
poisonpsych_ever	16.11.1 Poisoning by psychotropic agents	1936524	0.0023	0.0477
poisonmeds_ever	16.11.2 Poisoning by other medication and drugs	1936524	0.0157	0.1244
poisonnonmed_ever	16.11.3 Poisoning by nonmedicinal substances	1936524	0.0081	0.0895
otherexternal_ever	16.12. Other injuries and conditions due to external causes	1936524	0.1280	0.3341
hip_ever	16.2.1 Fracture of neck of femur (hip)	1936524	0.0023	0.0480
skull_ever	16.2.2 Skull and face fractures	1936524	0.0124	0.1106
upperlimb_ever	16.2.3 Fracture of upper limb	1936524	0.0569	0.2317
lowerlimb_ever	16.2.4 Fracture of lower limb	1936524	0.0526	0.2232
otherfractures_ever	16.2.5 Other fractures	1936524	0.0417	0.1999
spinal_ever	16.3. Spinal cord injury	1936524	0.0014	0.0377
concussion_ever	16.4.1 Concussion	1936524	0.0230	0.1500
otherintracranial_ever	16.4.2 Other intracranial injury	1936524	0.0090	0.0946
crushing_ever	Crushing injury or internal injury	1936524	0.0121	0.1091
openheadwound_ever	16.6.2 Open wounds of extremities	1936524	0.0543	0.2266
sprains_ever	16.7. Sprains and strains	1936524	0.4486	0.4974
superficial_ever	16.8. Superficial injury; contusion	1936524	0.2388	0.4263
burns_ever	16.9 Burns	1936524	0.0134	0.1151

Programming was developed to assign diagnoses and treatment from the CHAMPS inpatient and outpatient data files to UIC-quarters. These data files contain millions of records and developing SAS code that will properly generate the measures we need in an efficient manner has been challenging. The programming has been tested and processing of the data (beginning with the inpatient diagnostic data) began late in Year 2.

We also requested and have been receiving from DMDC quarterly UIC snapshots showing personnel by pay grade and gender for all active duty UICs during that quarter. We have requested data for 2001-2014 and have received data from the most recent quarter back to the second quarter of calendar year 2005. These data will be used to provide context information for the UIC-quarter measures we are developing.

The Health Risk Behavior survey data from 2005 and 2008 were obtained and analyzed using SUDAAN and Mplus to account for the complex cluster sampling. Analyses included estimation of unadjusted regression models for predictor variables, intermediate outcomes (e.g., substance use), and criminal/aggression outcomes and of multiple predictor regression models to assess the association of mental health and substance abuse problems with criminal activity and physical aggression outcomes as well as the interaction of these risk behaviors with demographics and military variables. Preliminary findings (pending final model estimation) from the 2008 data suggest:

- **Mental health outcomes:** High work or family stress, avoidant coping behaviors, high combat exposure, and high impulsivity were predictors of depression, generalized anxiety, PTSD, and serious psychological distress
- **Substance use outcomes:** Combat exposure and high impulsivity were significant predictors of alcohol abuse, illicit drug use, and prescription drug misuse; male gender was a risk factor for alcohol abuse; younger age was a strong risk factor for illicit drug use; and female gender and aged 35 years and over were predictors of prescription drug misuse
- **Criminal/aggressive act(s) (unadjusted regression)**
  - Illicit drug use was the primary risk factor for committing one or more criminal/aggressive acts; 66% of personnel who used illicit drugs (past month) reported 1+ criminal/aggressive acts in the past year (7 times the risk of non-users)
  - High impulsivity, younger age, enlisted rank, high-school-level education, and all mental health and substance abuse indicators were predictors of 1+ criminal/aggressive acts
- **Criminal/aggressive act(s) (multiple regression)**
  - Younger age (17–25 years) and high impulsivity were highest risk factors
  - Substance abuse, receipt of mental health treatment, avoidant coping, and high family stress were significant predictors

A manuscript has been drafted and will be submitted to a peer-reviewed journal in Year 3.

Results summarizing work to date was presented in a poster session at the 2014 Military Health Services Research Symposium. A copy of the poster is included as an appendix.

3.2 Prospective Analysis of Military Workplace Violence

Considerable progress was completed for the prospective study.

1. Two instruments were developed and tested internally: One for enlisted personnel and one for leaders. The instruments tap multiple domains and are longer than had been

anticipated in our original proposal. Because of the length and numerous skip patterns, the decision was made to administer the survey using computer technology rather than paper and pencil. The study team is working with RTI survey methodologies to identify the most appropriate hardware/software for this survey administration. There are several options and the decision was made late in Year 2 to focus on tablet-based data collection options. There are two approaches that appear viable—one uses a commercially available data collection system that RTI is currently assessing and the other uses a proprietary data collection system developed by RTI. The study team is acquiring several tablets and will test both systems before making a final decision about which software to use.

2. IRB approval for the prospective study was received from RTI's IRB. Small revisions are being completed to align the protocol with the data administration; once this amendment is approved, a Human Subjects Research Protocol package will be completed and submitted to the US Army Medical Research and Material Command Office of Research Protections.
3. An IRB application was prepared and submitted to RTI's IRB covering procedures and protocols to pilot test the instrument. The protocol is being revised to address concerns about distressed respondent protocols and will be resubmitted early in Year 3.
4. Outreach to the six bases where we have proposed to conduct surveys continued. We have made good contact with the US Marine Corps, and three of the four Army bases. We plan to increase our outreach efforts during the first quarter of Year 3 with a goal of conducting Wave 1 interviews in the Spring/early Summer 2015.

4. KEY RESEARCH ACCOMPLISHMENTS

Nothing to report.

5. CONCLUSION

During Year 3, we plan to analyze the retrospective data and prepare at least five manuscripts—three that will present findings relative to our research hypotheses, one that presents and discusses the conceptual model and our approach to analysis, and a fifth that will present the HRB findings. We also plan to field the first wave of the prospective survey and to begin data analysis and reporting.

6. PUBLICATIONS, ABSTRACTS, AND PRESENTATIONS

a. List all manuscripts submitted for publication during the period covered by this report resulting from this project. Nothing to report.
b. List presentations made during the last year (international, national, local societies, military meetings, etc.).
    a. Poster presented at the 2014 Military Health Services Research Symposium, August 19, 2014
    b. Program review presentation at Fort Detrick, MD, October 7, 2014

7. INVENTIONS, PATENTS AND LICENSES

Nothing to report.

8. REPORTABLE OUTCOMES

Nothing to report.

9. OTHER ACHIEVEMENTS

Nothing to report.

10. REFERENCES

Nothing to report.

APPENDICES n/a